REMARKS

Claims 1, 8, 9, 11, 14, and 18-20 have been amended. No claims are added or canceled. Hence, Claims 1-25 are pending in the Application.

I. ISSUES RELATING TO 103(a) —*TERUHI*, *MOY* AND *RFC 2676*

Claims 1, 2, 4, 5, and 7 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Teruhi et al., U.S. Pub. No. 2003/0072269 (hereinafter *Teruhi*) and J. Moy et al., IETF RFC 1247 "OSPF Version 2", July 1991 (hereinafter *Moy*) and further in view of Apostolopoulos et al., INTF RFC 2676 "QoS Routing Mechanisms and OSPF Extensions", August 1999 (hereinafter *RFC 2676*). The rejection is respectfully traversed.

Claim 1

Claim 1 is directed to a method of updating a routing table, and recites:

> selecting, from a set of routers, a particular router that is associated with a first actual time that is a shortest time among all times associated with routers in the set of routers;
> **wherein the first actual time has been updated with a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet;**
> sending a first data packet to the particular router;
> **receiving a second data packet that indicates a second actual time taken for the first data packet to travel to a destination indicated by the first data packet;**
> wherein the destination indicated by the first data packet is the same as the previous destination indicated by the previous data packet;
> updating the first actual time based on the second actual time; and
> updating the routing table based on information contained in the second data packet.
> (Emphasis added)

Claim 1 recites selecting, from a set of routers, a particular router that is associated with a first actual time that is a shortest time among all times associated with routers in the set of routers … **wherein the first actual time has been updated with a previous actual time taken for a previous data packet to travel to a previous**

destination indicated by the previous data packet. Claim 1 also recites receiving a second data packet that indicates a second actual time taken for the first data packet to travel to a destination indicated by the first data packet … wherein the destination indicated by the first data packet is the same as the previous destination indicated by the previous data packet. At least these features are not disclosed in *Teruhi*, *Moy* or *RFC 2676*, taken individually or in combination.

The Selecting Step of Claim 1

The Office Action admits that Teruhi is silent on "selecting, from a set of routers, a particular router that is associated with a first actual time that is a shortest time among all times associated with routers in the set of routers … **wherein the first actual time has been updated with a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**." The Office Action also admits that *RFC 1247* is silent on the shortest path in terms of traveling time.

The Office Action, however, argues that "RFC2676 teaches the shortest path in terms of traveling time (propagation delay, line 8 of first paragraph in Section 1.2, Page 5), which is the shortest time of the all the previous packets traveled from the set of nodes to the destination node." This is a mischaracterization of *RFC 2676*. The cited portion of *RFC 2676* reads "[s]pecifically, the extensions to LSAs that we initially consider, include only available bandwidth and delay." This merely states that the Link State Advertisements (LSAs) in OSPF may be enhanced to carry metrics such as link available bandwidth and link propagation delay. Nothing in this citation of *RFC 2676* discloses that the delay is "**a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**" or "a second actual time taken for the first data packet to travel to a destination indicated by the first data packet".

The Advisory Action further cites the 1st paragraph of section 2.2 of *RFC 2676*, which states "[i]t is assumed that each router maintains an updated database of the network topology, including the current state (available bandwidth and propagation delay) of each link." Clearly, this only states that each router maintains a configured, estimated propagation delay of each link. In particular, this says nothing that the propagation delay of each link in *RFC 2676* is the actual time for a packet to a destination, as argued by the Advisory Action.

As is well known in the art, in OSPF, cost metrics relating to a link, which include the above mentioned propagation delay of a link, are configured parameters, having nothing to do with the actual traveling time for a particular packet. *See, e.g.*, RFC 1586 at page 3 STEP 4 "Configure OSPF ... specifying ... link metric".

Indeed, if OSPF adopted what the Office suggests, a link metric would be an actual traveling time of a packet. If the link metric were an actual traveling time of a packet, the link metric would be susceptible to frequent variation from packet to packet, depending on specific network and traffic conditions affecting each packet. If link metrics frequently varied, then path costs, which depend on link metrics, also would frequently vary. If path costs frequently varied, then the shortest path between two nodes would frequently vary. Consequently, such an OSPF network would not be stable, as the network would not only have to deal with occasional link failures, but also have to deal with constant changes in path costs.

Furthermore, Claim 1 features the actual time for a packet to travel to a destination. Therefore, this time is associated with a **path** on which the packet actually travels. *RFC 2676* at most discloses a delay of a **link**, which is exchanged between neighbors in an LSA. The Office Action simply fails to explain why a **link** metric

exchanged between neighbors is an actual time for a particular packet to travel to a destination.

Finally, the Office Action makes arguments only by asserting that the propagation delay of a link in *RFC 2676* **is** the previous time and the second time featured in Claim 1. The Office Action fails to provide any evidence in support of this assertion.

The Receiving Step of Claim 1

The Office Action also argues that *Teruhi* discloses "**receiving a second data packet that indicates a second actual time taken for the first data packet to travel to a destination indicated by the first data packet**." This is incorrect. There is no disclosure in *Teruhi* that the delay 74 is an actual time that a control packet (a RTCP-SR packet) takes to travel from the sender to the receiver. Delay 74 as disclosed in *Teruhi* is in fact the difference between the receiving time of the last sender report and the generation time of the receiver report. *See* FIG. 9 of *Teruhi*. The delay 74 is not the actual time of any particular packet traveling from the sender to the receiver.

Indeed, even if the sender receives the delay 74 from the receiver, the actual time for the last sender report to travel from the sender to the receiver cannot be computed, as the actual time for the receiver report to travel from the receiver to the sender is not known.

The Office Action fails to provide any evidence in support of the assertion that receiving a second data packet that indicates a second actual time taken for the first data packet to travel to a destination indicated by the first data packet is disclosed in *Teruhi*.

As *Teruhi*, *Moy* and *RFC 2676* fail to disclose the above recited features of Claim 1, any combination of the three cannot disclose every feature of Claim 1.

For the reasons given above, Claim 1 is patentable over *Teruhi, Moy* and *RFC*

2676. Reconsideration is respectfully requested.

Claims 2, 4, 5, and 7

Claims 2, 4, 5, and 7 are dependent upon and thus include each and every feature of Claim 1 discussed above. Therefore, it is respectfully submitted that Claims 2, 4, 5, and 7 are allowable for at least the reasons given above with respect to Claim 1. Reconsideration is respectfully requested.

IV. ISSUES RELATING TO 103(a) —*TERUHI* AND *RFC 2676*

Claims 3 and 6 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over *Teruhi* in view of *RFC 2676*. The rejection is respectfully traversed.

Claims 3 and 6 are dependent upon and thus include each and every feature of Claim 1 discussed above. Therefore, it is respectfully submitted that Claims 3 and 6 are allowable for at least the reasons given above with respect to Claim 1. Reconsideration is respectfully requested.

V. ISSUES RELATING TO 103(a) —*MOY* AND *RFC 2676*

Claims 8 and 18-20 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over *Moy* in view of *RFC 2676*. The rejection is respectfully traversed.

Claims 8 and 18-20 each recite similar features as those discussed above with respect to Claim 1. For example, Claim 18 is a computer-readable medium claim that corresponds to method Claim 1. Claim 19 is recited in a format allowable by 35 USC §112, and corresponds to method Claim 1 discussed above. Claim 20 is an apparatus claim that corresponds to method Claim 1. Therefore, Claims 8 and 18-20 are patentable for at least the same reasons discussed above as to Claim 1. Reconsideration is respectfully requested.

VI. ISSUES RELATING TO 103(a) —*CARO* AND *RFC 2676*

Claims 1-25 are rejected under 35 U.S.C. § 103(a) as allegedly obvious over Gianni Di Caro et al., "AntNet: Distributed Stigmergetic Control for Communications Networks", Journal of Artificial Intelligence Research, 12/1998 (hereinafter *Caro*) in view of *RFC 2676*. The rejection is respectfully traversed.

Caro fails to disclose a number of features in Claim 1. For example, Claim 1 recites "selecting, from a set of routers, a particular router that is associated with a first actual time that is a shortest time among all times associated with routers in the set of routers, **wherein the first actual time has been updated with a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**" (emphasis added). On the other hand, *Caro* only discloses selecting a neighbor based on probabilistic values stored in the routing table. There is no disclosure in *Caro* that the probabilistic values are a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet, as featured in Claim 1.

The Office Action correctly concedes on page 9 that *Caro* (which the Office Action inadvertently refers to as "Teruhi") "**is silent on** the criterion is that the first packet is predicted to reach the destination in a shortest time (the first time)." However, the Office Action states that "[i]n the same field of endeavor, RFC 2676 further teaches routing the shortest path in terms of traveling time (delay, line 8 of first paragraph in Section 1.2, Page 5)."

Respectfully, as previously discussed with respect to the 103 rejection involving *RFC 2676*, there is no disclosure in *RFC 2676* for selecting, from a set of routers, a particular router that is associated with a first actual time that is a shortest time among all

times associated with routers in the set of routers, **wherein the first actual time has been updated with a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet**, as featured in Claim 1.

Further, a combination of the two references conflicts with the teaching of at least one of the references, and violates at least one principle of operation of the references.

A probabilistic model is fundamental to the operation of *Caro*. As described in the reference, all the steps, generating packets, selecting neighbor nodes to forward, updating routing information, etc., are all inextricably tied to the probabilistic model. For example, as *Caro* indicates on page 328 (item 7.i), "[t]he **statistical model** has to be able to capture this variability and to follow in a robust way the fluctuations of the traffic. **This model plays a critical role** in the routing table updating process (see item (ii) below)" (emphasis added). Furthermore, according to *Caro*, routing performance is improved under the AntNet because of the use of probabilistic entries (on page 330, "**The use of probabilistic entries is very specific to AntNet** and we observed it to be **effective**, improving the performance, in some cases, even by 30%-40%. Routing tables are used in **a probabilistic way not only** by the ants **but also** by the data packets. This **has been observed to improve** AntNet performance, which means that the way the routing tables are built in AntNet is **well matched with a probabilistic distribution** of the data packets over all the good paths" (emphasis added)).

A combination of *RFC 2676* and *Caro*, as suggested by the Office Action, would completely vitiate the advantages gained by the probabilistic model of *Caro*, rendering the critical role played by the probabilistic model in *Caro* unfulfilled.

The Advisory Action states that "Caro's teaching is used to estimate the routing

parameters of a routing table, while RFC 2676 is used to make decision of shortest path based on routing table in the Office Action. There is no conflict[] between them because they are used for different purposes and are independent to each." This is incorrect characterization of the proposed combination of *Caro* and *RFC 2676*.

Repeatedly, the Office Action has asserted that *Caro* discloses "selecting, from a set of routers, a particular router that is associated with a first actual time that is a shortest time among all times associated with routers in the set of routers ... wherein the first actual time has been updated with a previous actual time taken for a previous data packet to travel to a previous destination indicated by the previous data packet." The Office Action has also asserted that "*Caro* is silent on the path that is the shortest in terms of delay time from a source router to a destination router and the shortest amount of time is updated with data packet travel to the specified destination." The Office Action further has asserted that *RFC 2676* can be combined with *Caro* to "selecting a neighbor router that has a lowest amount of delay time from source node to the destination node in searching the best routing."

Thus, under this proposed combination as asserted by the Office Action, *Caro* and *RFC 2676* must be integrated in such a manner that the probabilistic route selection in *Caro* is replaced with selecting a neighbor router that has a lowest amount of delay time from source node to the destination node in searching the best routing. As a result, *Caro*'s critical probabilistic model must be replaced in this proposed combination. Hence, under this proposed combination, contrary to what the Advisory Action argues, *Caro* and *RFC 2676* are not used for different purposes or are independent to each.

For these reasons, a proposed combination of *Caro* and *RFC 2676* would violate at least one principle of operation of the references.

Moreover, the Office has rejected the claims based on the theory that a skilled artisan would **combine** the references to yield the invention. To now contend that the references are cited for separate and independent aspects is totally inconsistent with a rejection based on the combination. The Office cannot simultaneously argue that a person of skill would combine references while ignoring parts of the references that would direct the skilled person in a different direction (e.g., to cause giving up the critical probabilistic model), or would lead the skilled person not to combine them.

Claims 8, 9 and 18-20

Claims 8, 9 and 18-20 each recite similar features as those discussed above with respect to Claim 1. For example, Claim 18 is a computer-readable medium claim that corresponds to method Claim 1. Claim 19 is recited in a format allowable by 35 USC §112, and corresponds to method Claim 1 discussed above. Claim 20 is an apparatus claim that corresponds to method Claim 1. Therefore, Claims 8, 9 and 18-20 are patentable for at least the same reasons discussed above as to Claim 1. Reconsideration is respectfully requested.

Claims 2-7, 10-17 and 21-25

Claims 2-7, 10-17 and 21-25 are dependent upon and thus include each and every feature of Claim 1 discussed above. Therefore, it is respectfully submitted that Claims 2-7, 10-17 and 21-25 are allowable for at least the reasons given above with respect to Claim 1.

VII. CONCLUSION

For the reasons set forth above, Applicant respectfully submits that all pending claims are patentable over the art of record, including the art cited but not applied. Accordingly, allowance of all claims is hereby respectfully solicited.

The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

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/ZhichongGu#56543/
Zhichong Gu
Reg.No. 56,543

2055 Gateway Place, Suite 550
San Jose, CA 95110
Telephone No.: (408) 414-1080
Facsimile No.: (408) 414-1076